

An Empirical Assessment of Customer Awareness, Acceptance, and Behavioral Intentions Toward Carbon Tax Policies on Transport-Related Emissions

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Abstract

Carbon tax is levied by government to control greenhouse gas emission to maintain environmental balance. Carbon pricing helps to adopt cleaner energy for sustainable. India has not directly imposed carbon tax for several reasons which includes imposing carbon tax may affect intensive sectors like steel, cement and energy industries etc., and slowdowns economic growth by reducing GDP it also financially burdens low-income class. Study aims to explore level of awareness about carbon tax among public. To investigate public perception and acceptance of carbon tax. This study uses quantitative approach. Data collected from 108 respondents through structured questionnaire using google forms. To analyze data Multiple R, one sample T test, Correlation and Chi square is used. Study found that demographic variables like age, sex and income level are loosely related with the knowledge of carbon taxation policies. Statistical evidence has indicated that carbon tax is not enough to produce substantial behavioural change. Study adds to the current literature by offering early perspective of general public about carbon tax.

Keywords: Carbon tax, Perception, Sustainability, Policies and environmental balance.

Introduction:

A carbon tax is a government-imposed price on the carbon content of fossil fuels (coal, oil, and gas) that aims to reduce greenhouse gas

emissions by forcing polluters to pay for their environmental impact.

Carbon pricing seeks to mitigate climate change by pricing the external costs of

greenhouse gas emissions. Internalizing emissions' externalities helps to prevent market failures by ensuring that the price of an item or service appropriately represents its impact on society. Carbon pricing focuses on CO₂, the principal greenhouse gas that causes climate change, but it can also be applied to other greenhouse gas emissions.

Carbon pricing can be implemented using two major policy tools: a carbon tax and a cap-and-trade system. A carbon tax assigns a fixed price to each unit of carbon emissions during a given time period, but it does not limit the total quantity of emissions produced. A cap-and-trade system, on the other hand, imposes a restriction (or cap) on the total quantity of emissions permitted during a specified time period. However, in this system, market forces decide the price of emissions permits, as enterprises can purchase and sell emission allowances among themselves.

However, both carbon pricing schemes may coexist, or a hybrid instrument may be adopted that combines emissions trading and taxation elements. To avoid very low and very high carbon prices, the emissions trading system should contain a floor and ceiling price. Before (further) introducing

carbon pricing, it is more economical to first eliminate any environmentally harmful subsidies, as these instruments contradict each other. For example, subsidies for fossil fuels can result in a negative carbon price.

Despite the benefits of carbon pricing, implementing a successful and ambitious carbon pricing strategy requires taking into account more than just economic efficiency and cost effectiveness. First, carbon pricing must successfully cut carbon emissions in practice. To be environmentally beneficial, it must be adopted in a large number of countries at a sufficiently high cost. Second, carbon pricing's distributional implications must be considered. Third, carbon pricing must be acceptable to the general public and other societal actors before it can be implemented. The selection of instruments to address climate change is based on several evaluation factors, making it an inherently complex decision for policymakers.

In recent decades, international agreements have tried to stabilize greenhouse gas concentrations at levels that will prevent dangerous interferences with the climate system. However, mounting data suggests that existing mitigating efforts are insufficient. Though the United Nations and

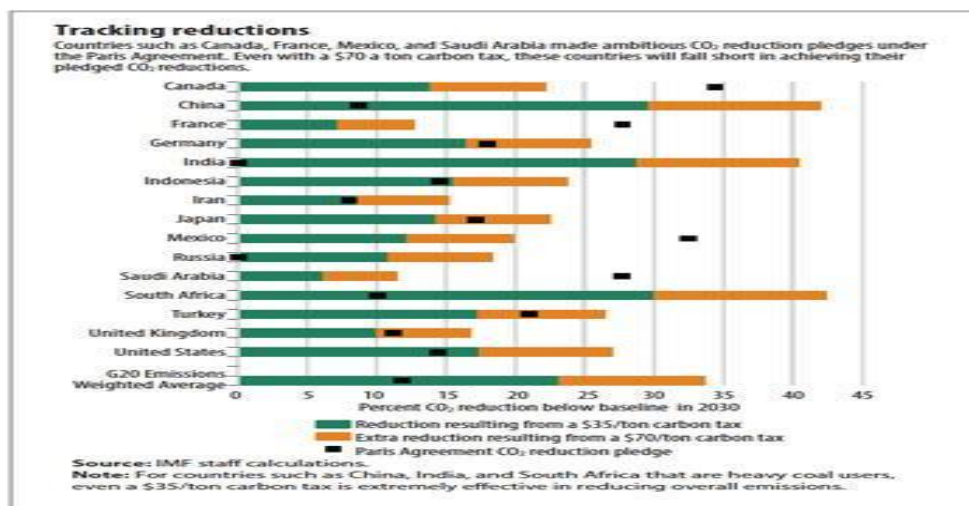
the World Bank encourage the implementation of a carbon tax, governments have not responded positively.

CO₂ Emission Report 2024 (EDGAR: Emissions Database for Global Atmospheric Research)

COUNTRY	MTON CO ₂	%WORLD TOTAL
China	13259.64	33.98
United States	4682.04	12.00
India	2955.18	7.57
EU	2512.07	6.44

According to recent data, China is responsible for 33.98% (13,259.64 MtCO₂) of total world CO₂ emissions, followed by the United States (12.00%), India (7.57%), and the European Union (6.44%). China and the European Union are among the main emitters to have developed countrywide emissions trading schemes, whereas the United States

has regional and state-level carbon markets. In contrast, India's mitigation policy has primarily depended on fiscal measures, such as coal taxation, rather than a complete national carbon trading system. These discrepancies reflect the disparities in institutional and governmental approaches to climate mitigation among leading economies.



The graph provides a general picture of the effectiveness of various amounts of carbon taxes. Reductions in emissions caused by a \$35 per ton carbon tax (green bars) would be more than enough to achieve the Group of Twenty countries' overall pledges. The black squares in the chart indicate agreements to reduce fossil fuel CO₂ emissions by a percentage below baseline levels by 2030.

A carbon tax of \$35 a ton would be most successful in cutting emissions in countries that rely heavily on coal, such as China, India and South Africa.

In OECD and G20 countries, over 60% of carbon emissions from energy use remain unpriced. Indeed, implicit carbon pricing dominates the effective marginal and average carbon tax rates for energy consumption. More specifically, 89% of carbon costs come from gasoline taxes, 4% from carbon taxes, and 7% from permit prices (OECD, 2023). The implementation of ambitious carbon price policies remains restricted. Only 19% of OECD and G20 countries' energy-related carbon emissions total 60 euros per tonne (OECD, 2023).

A recent body of literature has begun to investigate the public acceptability of carbon taxes, pointing to a number of significant

barriers, such as distributional effects on low-income households. The issue of perceived environmental ineffectiveness: the general public often overlooks the incentive effect of carbon pricing, expecting tax money to be allocated for environmental causes. When this is not the case, most people believe that carbon prices are only a ruse to increase budgetary revenues. When tax revenues are targeted for other reasons, the general public is often concerned about the idea of using the proceeds of an environmental tax for anything unrelated to the environment.

In recent years, the literature has focused more on the perceived environmental impact of carbon pricing. While economists tend to take the positive environmental impacts for granted, the effectiveness of carbon taxes does not appear to be universally accepted by the general population.

Despite the benefits of carbon pricing, implementing a successful and ambitious carbon pricing strategy requires taking into account more than just economic efficiency and cost effectiveness. First, carbon pricing must successfully cut carbon emissions in practice. To be environmentally beneficial, it must be adopted in a large number of countries at a sufficiently high cost. Second,

carbon pricing's distributional implications must be considered. Third, carbon pricing must be acceptable to the general public and other societal actors before it can be implemented.

The carbon price is simply one of several factors that can help reduce carbon emissions. Its effectiveness varies with market maturity, with decreases ranging from 5-21% in established markets. The best outcomes are obtained from hybrid schemes that combine carbon taxes and emission trading systems. These plans could lead to a 32.5 percent cut in 2060 when they are combined with carbon capture, utilization and storage technology.

Research Gap:

- Existing studies emphasizes on macroeconomic and environmental outcomes, while few empirical researches examine customer awareness, acceptance and behavioural intentions together, particularly in context to transportation.
- Few researchers have examined consumer centric perspective on readiness, support and government subsidies which influences Indian customer behavioural intentions.

Objectives of the study:

1. To examine the level of customer awareness regarding carbon tax policies imposed on transport-related emissions
2. To analyse customer perceptions and attitudes toward the effectiveness and fairness of carbon taxation in the transportation sector
3. To evaluate the degree of public acceptance of carbon tax policies and identify factors influencing policy support or resistance
4. To identify socio-economic and demographic determinants influencing acceptance and behavioural response toward carbon tax policies.
5. To provide policy recommendations for improving public acceptance and enhancing the effectiveness of carbon taxation in reducing transport emissions

Hypothesis

- **H0:** Awareness of carbon tax policies doesn't have a combined effect on demographic variables (age, gender and income).
- **H1:** Awareness of carbon tax policies has a combined effect on demographic variables (age, gender and income).
- **H0:** Respondents do not believe that a carbon tax reduces pollution levels.

H1: Respondents believe that a carbon tax on vehicles can significantly reduce pollution levels in Indian cities.

- **H0:** Respondents do not agree that high-emission vehicle owners should pay higher environmental taxes.

H1: Respondents agree that high-emission vehicle owners should pay higher environmental taxes.

- **H0:** There is no significant relationship between respondents' belief that a carbon tax reduces pollution and their support for higher environmental taxes on high-emission vehicle owners.

H1: There is a significant relationship between respondents' belief that a carbon tax reduces pollution and their support for higher environmental taxes on high-emission vehicle owners.

- **H0:** Environmental benefits, personal cost, and government transparency do not significantly influence respondents' level of support and acceptance of carbon tax, and no single factor has a dominant influence.

H1: Environmental benefits, personal cost, and government transparency significantly influences respondents' level of support and acceptance of carbon tax, with one factor having a stronger influence than the others.

- **H0:** Respondents are not motivated to reduce their carbon footprint by the introduction of a carbon tax.

H1: Respondents are motivated to reduce their carbon footprint by the introduction of a carbon tax.

Literature review

Carbon pricing is a versatile policy tool that not only reduces emissions but also raises domestic revenue and promotes green growth (Van Trotsenburg, 2025). Such policies, however, are directly related to the attitude of the population since those who have a more pro-environmental value are more likely to agree with environmental taxes, particularly when they believe that these policies have a meaningful impact on the achievement of environmental protection objectives (Kaiser et al., 2023; Muhammad et al., 2021). Relatively high consumer environmental consciousness in developed societies also confirms the advocacy of carbon pricing efforts (Claudy et al., 2013). In the transport industry, it is one of the main industries that contribute to the emission of greenhouse gases, and in this case, policy interventions are more significant in attaining the sustainability goals (Kronsell et al., 2016). Consumer awareness serves two functions in

it: it is the determinant of the degree of attitude towards carbon pricing, and the reaction to the policies. Perceived effect, equity, and personal influence become important factors in shaping the opinion of the people, and uncertainty or fear of higher costs of living become the reasons that lead to opposition in environmental protection, and unclear communication of the advantages of the environment makes the difference in reducing opposition (Carattini, Carvalho, and Fankhauser, 2018). Regardless of these factors, due to the economic aspects, transport choices are less based on environmental goals, which include ensuring that total turnaround profit is maximized, and rather on economic factors, like trying to avoid excessive CO₂ transport emissions (Pasha et al., 2021). Studies indicate that the greater the implementation of carbon taxes is perceived as supporting climate mitigation through the earmarked revenues, coupled with concerns over alleviating inequality, the higher the popularity of carbon taxes becomes with the populace as is the case in Norway (Dugstad, Grimsrud, and Lindhjem, 2024). Equally, in Lithuania, the readiness to pay a tax on cars to decrease transport emissions will mostly rely on the levels of

income, environmental consciousness and the understanding of tax fairness (Streimikiene, Balezentis, and Morkunas, 2018). The institutional form of carbon taxes is also effective depending on the way in which costs are allocated: the higher the reduction of emissions is achieved through assignment of costs to consumers, but the effects on firm profits depend on pricing mechanisms (Hu and Zhou, 2014). OECD, United Nations, and World Bank are the international bodies promoting environmental taxes, but the political viability will only be possible in the long term, depending on the citizens (Muhammad, Hasnu, and Ekins, 2021). The example of Sweden is revealing as a carbon tax reduced the CO₂ emissions of the transport sector by about 11 percent in comparison to other comparable countries that did not implement such a tax, demonstrating that fuel taxation can prompt people to use more efficient vehicles (Andersson, 2019). A larger body of evidence indicates that integration of behavior-based interventions such as encouraging the use of public or active transport, with technology-based interventions, such as use of cleaner fuels, and more efficient vehicles, are most

effective at bringing about emission reductions (Gross, Heptonstall, Anable, and Greenacre, 2009). Properly designed carbon taxes can therefore meet these goals simultaneously by reducing retrogressive impacts on households with low incomes by the tax by implementing revenue recycling schemes, and by increasing public acceptance via other policies such as gradual implementation, test periods, and clear communication of benefits (Koppl and Schratzenstaller, 2023; Carattini, Carvalho, and Fankhauser, 2018).

Methodology:

The research relies on primary data gathered on 109 participants by means of the online

questionnaire to be completed with the help of Google Forms. Descriptive statistics were applied to give a summary of the responses, chi-square test, t-tests and correlation were used to describe the relationship and difference between key variables with regards to awareness, acceptance and behavioural intentions of carbon tax policies.

Analysis and Interpretation:

➤ **H0:** Awareness of carbon tax policies doesn't have a combined effect on demographic variables (age, gender and income).

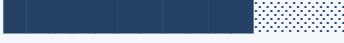
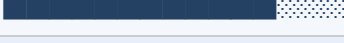
H1: Awareness of carbon tax policies has a combined effect on demographic variables (age, gender and income)

A. Awareness by Gender

Gender	Aware (Yes)	Aware (No)	Total	Awareness Rate
Female	52	15	67	 78%
Male	38	3	41	 93%
Prefer not to say	0	1	1	 0%
Total	90	19	109	

B. Awareness by Age Group

Age Group	Aware (Yes)	Aware (No)	Total	Awareness Rate
18 – 25	56	16	72	 77%
26 – 35	14	1	15	 93%
36 – 49	13	2	15	 86%
50 and above	7	0	7	 100%
Total	90	19	109	

C. Awareness by Monthly Household Income				
Income Group	Aware (Yes)	Aware (No)	Total	Awareness Rate
Below ₹25,000	26	4	30	 86%
₹25,001 – ₹50,000	25	9	34	 73%
₹50,001 – ₹1,00,000	26	3	29	 89%
Above ₹1,00,000	13	3	16	 81%
Total	90	19	109	

Regression statistics

Multiple R	0.261701582515137
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Interpretation

The Multiple R value of 0.262 shows that demographic factors (age, gender, and income) have positive relationship though it is weak. This implies that with age, gender and income variations, awareness is likely to rise slightly but, the relationship is not very high. This means that a combination of the demographic

factors can only affect the carbon tax policy awareness marginally.

➤ **A carbon tax on vehicles could reduce pollution levels in Indian cities.**

H0: Respondents do not believe that a carbon tax reduces pollution levels.

H1: Respondents believe that a carbon tax on vehicles can significantly reduce pollution levels in Indian cities.

Mean	sd	Sample size	T test	P value
3.75	0.92852008	108	-0.0783463	0.46884945

Interpretation

The one-sample t-test results show that the p-value (0.4688) is greater than the 0.05 significance level. Therefore, the null hypothesis is not rejected. This indicates that respondents do not significantly believe that a carbon tax on vehicles can reduce pollution levels in Indian cities.

➤ High-emission vehicle owners should pay higher environmental taxes

H₀ (Null Hypothesis): Respondents do not agree that high-emission vehicle owners should pay higher environmental taxes.

H₁ (Alternative Hypothesis): Respondents agree that high-emission vehicle owners should pay higher environmental taxes.

Mean	sd	Sample size	T test	P value
3.7962963	0.90439487	108	0.45154954	0.32625372

Interpretation

A one-sample t-test showed that the level of agreement that high-emission vehicle owners should pay higher environmental taxes was not statistically significant ($t = 0.452$, $p = 0.326$). Since the p-value is greater than 0.05, the null hypothesis is not rejected, indicating that respondents do not significantly agree with imposing higher environmental taxes on high-emission vehicle owners.

➤ Is there a significant relationship between respondents' belief that a carbon tax reduces pollution and their support for

higher environmental taxes on high-emission vehicle owners?

H₀ (Null Hypothesis): There is no significant relationship between respondents' belief that a carbon tax reduces pollution and their support for higher environmental taxes on high-emission vehicle owners.

H₁ (Alternative Hypothesis): There is a significant relationship between respondents' belief that a carbon tax reduces pollution and their support for higher environmental taxes on high-emission vehicle owner

Variables	r
Belief in carbon tax effectiveness & Support for higher environmental taxes	-0.039

Interpretation

The Pearson correlation analysis revealed a very weak negative relationship between respondents' belief that a carbon tax reduces pollution and their support for higher environmental taxes on high-emission vehicle owners ($r = -0.039$). This relationship is negligible and not statistically significant. Therefore, the null hypothesis is not rejected.

➤ **Factor would most influence support to accept carbon tax.**

H_0 (Null Hypothesis): Environmental benefits, personal cost, and government transparency do not significantly influence respondents' level of support and acceptance of carbon tax, and no single factor has a dominant influence.

H_1 (Alternative Hypothesis): Environmental benefits, personal cost, and government transparency significantly influences respondents' level of support and acceptance of carbon tax, with one factor having a stronger influence than the others.

Chi square vale	df	Chi square value tabulated
29.56	2	5.991

Interpretation

The chi-square test results support H_1 , showing that environmental benefits are the most influential factor affecting respondents' support for carbon tax policies ($\chi^2 = 29.56$, $p < 0.05$).

➤ **Carbon tax would motivate to**

reduce my carbon footprint.

Null Hypothesis (H_0): Respondents are not motivated to reduce their carbon footprint by the introduction of a carbon tax.

Alternative Hypothesis (H_1): Respondents are motivated to reduce their carbon footprint by the introduction of a carbon tax

A one-sample t-test showed that respondents' motivation to reduce their carbon footprint

Interpretation

following the introduction of a carbon tax was moderate ($M = 3.35$, $SD = 0.87$, $n = 108$) but significantly lower than the hypothesized benchmark ($t = -4.79$, $p = 2.68 \times 10^{-6}$). Thus, despite statistical significance, the findings

do not support the alternative hypothesis, indicating that a carbon tax alone does not strongly motivate respondents to reduce their carbon footprint

mean	sd	Sample size	T test	P value
3.35185185	0.870881602	108	-4.7912598	2.6829E-06

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	% Agree+	% Disagree+	Weighted Score (1–5)
A carbon tax on vehicles could reduce pollution levels in Indian cities	12	57	30	4	6	63.3%	9.2%	3.60
Carbon taxation could significantly contribute to India's climate goals	6	50	44	5	4	51.4%	8.3%	3.45
High-emission vehicle owners should pay higher environmental taxes	22	54	23	8	2	69.7%	9.2%	3.79

Carbon tax is a fair way to control vehicle emissions	12	57	30	4	6	63.3%	9.2%	3.60
If the Indian government introduces a carbon tax on fuel (₹2–₹5 per litre increase), would you support it?	7	35	34	20	13	38.5%	30.3%	3.03
Carbon tax would motivate me to reduce my carbon footprint	4	52	40	6	7	51.4%	11.9%	3.37

Analysis using descriptive statistics

- Distribution of Respondents' Opinions on the Effectiveness of a Carbon Tax in Reducing Pollution in Indian Cities

Response Category	Percentage (%)
Strongly Agree	18.30%
Agree	49.50%
Neutral	24.80%
Disagree	3.7%*
Strongly Disagree	3.7%*

Interpretation:

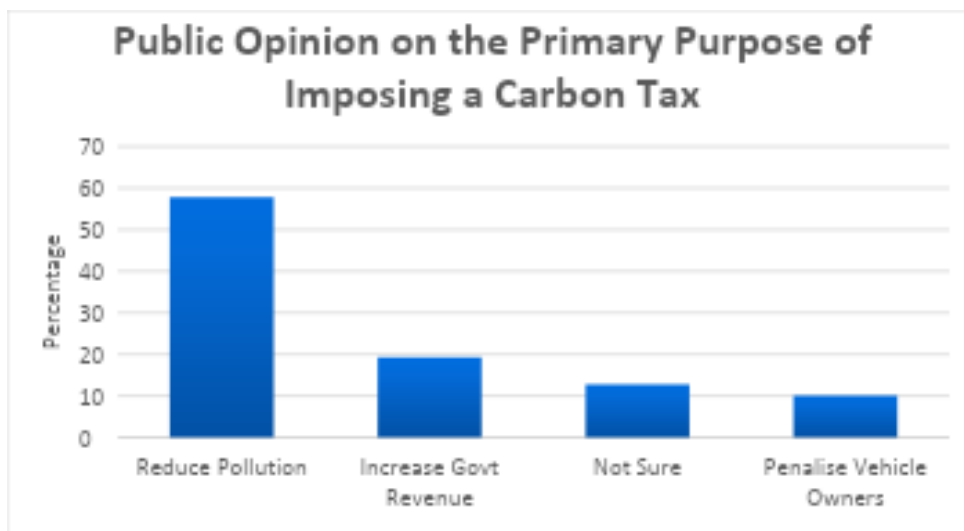
The data indicates that a majority of respondents support the idea that a carbon tax

on vehicles could reduce pollution levels in Indian cities. Close to 67.8 percent of the respondents agree or strongly agree to the

statement, which demonstrates high levels of support of the policy by the population. The proportion of those who are neutral is about 24.8% indicating that there is some form of doubt or rather they are not aware of its effectiveness. The percentage of those that do

not agree or strongly disagree is very low (7.4), which means that there is not a lot of opposition. In general, the results indicate that there is a positive attitude held by the people on the introduction of a carbon tax as an environmental policy tool.

2) Public Opinion on the Primary Purpose of Imposing a Carbon Tax



Interpretation:

The results show that most of the respondents (57.8) assume that the main aim of a carbon tax is to minimize pollution. This implies that there is high awareness of the public to the environmental goal of such a taxation policy. But 19.3 percent view it largely as a revenue-generating instrument to the government,

which suggests a certain degree of doubt about the policy intentions. A smaller number (10.1) thinks it is intended to punish the owners of vehicles and 12.8% do not know what it is. All in all, the findings indicate that the imperative to protect the environment is generally accepted as the primary reason why a carbon tax should be applied.

3) Respondents' Views on the Contribution of Carbon Taxation to India's Climate Goals

Response Category	Percentage (%)
Strongly Disagree	3.7%

Disagree	3.70%
Neutral	41.30%
Agree	46.80%
Strongly Agree	4.6%

Interpretation

The statistics show that around 46.8 of the people interviewed agreed that carbon tax would play a big role in helping India to achieve its climate targets. The percentage (41.3) of those who are not in support is quite large implying moderate awareness or confusion on its role in meeting climate targets. A small percentage of them say that they disagree, which means that there is not

much resistance to the environmental impact of the policy. The percentage of strong disagreement is very low which indicates that carbon taxation is generally accepted as a tool of climate policy. On the whole, the research points to a rather optimistic but cautious attitude of respondents in terms of the role of carbon taxation in the support of Indian climate obligations.

4) Middle- and Low-Income group Perception of the Distributional Impact of Carbon Tax.

Response Category	Percentage (%)
TRUE	89.60%
FALSE	10.40%

Interpretation

These findings indicate that a considerable proportion of the respondents (89.6) reckon that a carbon tax can potentially impact the middle- and low-income group disproportionately. This shows that there is high concern by the people about equity and equality of such a taxing policy. The

proportion of those who do not agree with the concept of possible regressive effects is only 10.4% indicating that there is little resistance against the concept. The results emphasize that carbon taxation could be beneficial to the environment, but it is also important to note that other social justice aspects are relevant when delivering it. As such, policy makers

might have to include countermeasures or earners.

subsidies to cushion against the poor income

5) The opinion of the respondents on whether or not Carbon tax is a just approach to regulating vehicle emissions.

Response Category	Percentage (%)
Strongly Disagree	3.7%
Disagree	4.6%
Neutral	30.30%
Agree	54.10%
Strongly Agree	7.30%

Interpretation

The data has shown that most of the respondents (61.4) either agree or strongly agree that a carbon tax is one of the fair means of regulating vehicle emissions. This is the general positive tolerance of carbon taxation as a fair environmental policy measure. Nevertheless, 30.3% of the respondents are neutral, and it can be concluded that they are moderately unsure

about its fairness. It has a very low percentage of those who disagree, which shows that there is not much opposition to the concept. All in all, the findings indicate that the majority of the respondents have a positive view of carbon tax as fair, though there is a lack of awareness and preference that needs to be clarified about how carbon tax is being implemented and how it is equitable

6) Social Perception of EVs and Low-Emission Vehicles Subsidies in the case of introducing the Carbon Tax.

Response	Percentage
Yes	89.90%
No	10.10%

Interpretation

In the table, it is evident that the majority of the population supports the introduction of subsidies on electric vehicles (EVs) and those with low emissions in case a carbon tax is set. A large proportion of the respondents (89.9) are in favor of subsidies which means that, financial incentive as a supplementary policy

to carbon taxation is widely accepted. The percentage of the respondents (that are against such subsidies) is only 10.1% implying that there are a few objections. The implication of this finding is that carbon tax policies can be more readily accepted by the population with the aid of subsidies

7) Public Support of introduction of Carbon tax on Fuel in India (₹ 2- ₹ 5 per Liter Increase)

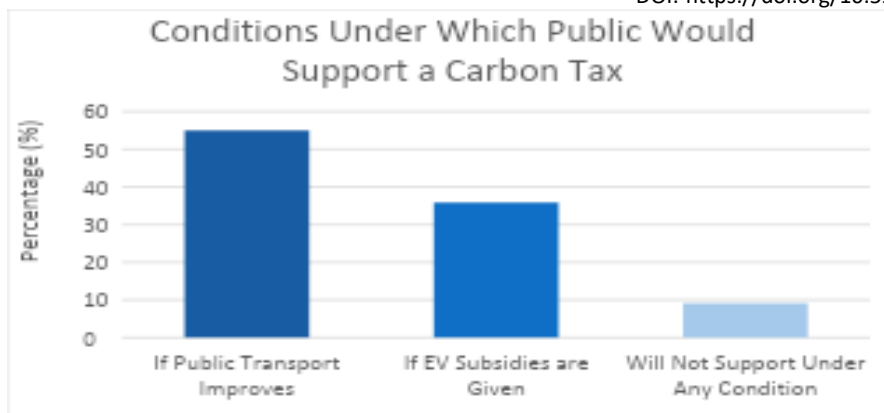
Opinion Level	Percentage
Strongly Disagree	11.00%
Disagree	16.50%
Neutral	35.80%
Agree	31.20%
Strongly Agree	5.50%

Interpretation

The table shows that there is a mixed sentiment of the people on whether or not a carbon tax on fuel should be introduced in India. The respondents who are neutral in their opinions (35.8) represent a massive percentage indicating that they are not certain or even aware of the implications of the

policy. The backing of the carbon tax is fairly high with 36.7 percent of the respondents either saying they support or vehemently supporting the tax. Nevertheless, only 27.5 percent of respondents are in favor of the tax, which means that they are also afraid of paying more fuel price.

8) Carbon tax Support Conditions in Public Opinion.

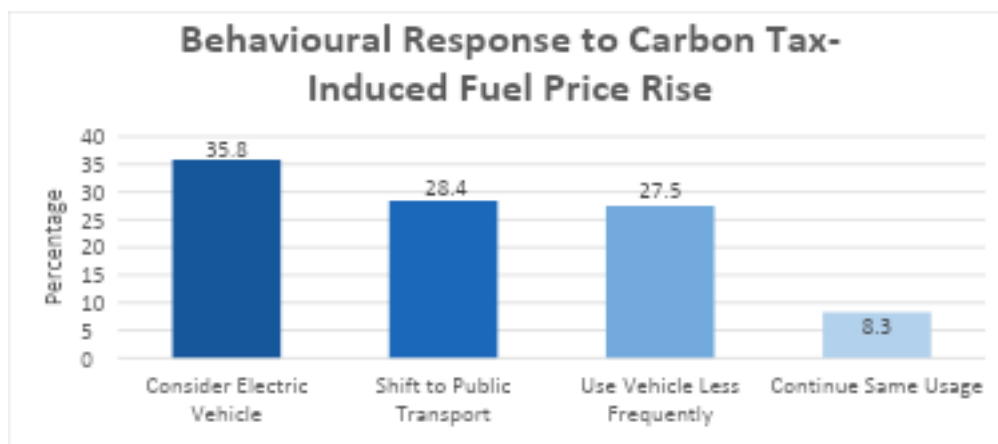


Interpretation

Most of the respondents (55 percent) said they would approve a carbon tax in case the infrastructure of the public transport improves, and this is the role of having an alternative of traveling by any other method than cars that are available and efficient. It would also have a substantial base (35.8) that

would endorse it in case electric vehicle subsidies are offered, indicating that they are interested in economic incentives of a greener option. A very small percentage (9.2) still opposes it in all circumstances, which indicates that the majority of the population is willing to consider the idea of carbon tax in case it is accompanied by practical solutions.

9) Behavioural Change to be exhibited with the Rise in Fuel Prices as a result of Carbon Tax.



Interpretation

The table indicates that the effect of a carbon tax on individuals traveling is probable to

impact on the fuel price. The highest percentage of the respondents (35.8) stated that they would think about getting electric

cars, which indicates an opportunity to cleaner options. Somewhat, a significant proportion of the respondents would switch to public transport (28.4%), or cut the use of

vehicles (27.5%), which implies a possible decrease in fuel usage. Few (8.3) indicated that they had their continuity of use in case of increased prices.

10) Sensation of India Preparedness to execute a Carbon tax Policy.

Response	Percentage
Yes	27.50%
No	29.40%
Maybe	43.10%

Interpretation

The results also suggest that most of the respondents (61.4) agree or strongly agree that carbon tax is a rational approach to regulating vehicle emission. This is the general positive tolerance of carbon taxation as a fair environmental policy measure. Nevertheless, 30.3% of the respondents are neutral, and it can be concluded that they are moderately unsure about its fairness

Findings

The paper concludes that demographic variables like age, sex and income level are loosely related with the knowledge of carbon taxation policies. Most of the respondents believe that carbon tax is an effective measure of curbing pollution and helping in combating climate change and an inferential

analysis reveals that the perception is not statistically significant. Environmental protection and pollution are the most powerful attributes that affect the consideration of carbon tax policies. The majority of them feels that carbon tax policies can unduly impact on middle- and low-income members.

Statistical evidence has indicated that carbon tax is not enough to produce substantial behavioural change. When carbon tax is used complementary to other measures, the mass media would be able to favor it by a significant margin compared to the state of its use as a single-point policy. The ambivalent attitudes towards the willingness of India to have carbon tax implementation imply that it should be done in phases. Trust and

acceptance can be enhanced by earmarking funds towards environmental and transport related projects and initiatives.

Policy recommendations:

Should create better public awareness regarding the carbon tax policies. The government ought to embark on systematic awareness programs on how carbon tax works, how the funds are being used and its long time environmental and economic advantages. Carbon taxes must be enforced with a combination of observable and physical positives like better transportation network and incentives on electric and low-emission cars. Compensatory mechanisms ought to be included in the government. They might be in the form of specific subsidies, income-related rebates or cut in the prices of traversing by means of transport.

The government ought to increase incentives of EVs. This will take the form of purchase subsidies, tax exemptions, development of charging infrastructure and low registration charges. A slow roll out would give time to the consumer and markets to adapt, minimizes the economic shock and it would also give the policymakers an opportunity to perfect the policy depending on the public reaction and performance. Carbon tax as a

source of revenue should be transparent in revenue disbursement. Appropriate allocation of funds to environmental protection programs, transport infrastructure and social support programs can make the difference in terms of acceptance and mistrust among the respondents.

Discussion

The findings of the study showcase significant results with respect to public awareness, perception, and acceptance of carbon tax policies in the context of transport-related emissions in India. The study represents the results drawn from 108 respondents highlighting environmental consciousness, distributional concerns, and policy trust. The demographical results show that majority of both the gender, all the strata of age group and income group are aware about the concept of carbon tax policies. Almost equal number of respondents use private vehicles and public transportation for commuting daily. The Multiple R value of 0.262 shows that demographic factors (age, gender, and income) have positive relationship though it is weak. This means that a combination of the demographic factors can only affect the carbon tax policy awareness marginally. The findings imply

that carbon tax awareness in India is still in a budding stage across all demographic segments, making public education a critical policy priority. This is consistent with the broader literature suggesting that while socio-economic characteristics do influence environmental policy attitudes, they are not the sole or dominant determinants (Muhammad et al., 2021; Streimikiene et al., 2018). While analyzing the Environmental & Climate Impact, the respondents reveal a moderately positive sentiment transitioning to cleaner vehicle types, supported by a carbon tax, could effectively reduce pollution levels in Indian cities and implementation of Carbon taxation could significantly contribute to India's climate goals.

The one-sample t-test results show that the p-value (0.4688) is greater than the 0.05 significance level. This indicates that respondents do not broadly believe that a carbon tax on vehicles can reduce pollution levels in Indian cities. Hence it can be inferred that even though there is a positive thought towards carbon pricing, it doesn't hold conviction among the general public. The weak and negligible correlation ($r = -0.039$) between the belief in carbon tax effectiveness and support for higher

environmental taxes on high-emission vehicle owners further justifies this gap between general awareness and specific policy support. The chi-square test result ($\chi^2 = 29.56$, $p < 0.05$) identifies environmental benefits as the single most influential factor driving acceptance of carbon tax. This aligns well with prior literature indicating that individuals with stronger pro-environmental values are more likely to endorse environmental taxes (Kaiser et al., 2023; Carattini et al., 2018). However, the there exists a large neutral group (41.3%) regarding India's climate goals suggests that a significant portion of the population remains uncertain about the concrete effectiveness of carbon taxation as a climate policy instrument.

One of the most prominent findings the researchers observed is the strong public concern regarding distributional equity which consists of 89.6% of respondents believing that the carbon tax could excessively burden middle- and low-income groups. The high level of support (89.9%) for EV subsidies as a complementary policy confirms that the public is more likely to accept carbon taxes when a visible relief measure is provided. The behavioural

intention data also supports the idea that the carbon tax alone is not a sufficient policy control. The t-test ($t = -4.79$, $p < 0.001$) reveals that the motivation of the respondents to reduce their carbon footprint is statistically significant. However, the mean score ($M = 3.35$) is below the hypothesised benchmark, which translates to a moderate motivational impact. However, most respondents are willing to switch to EVs (35.8%), use public transport (28.4%) or cut down vehicle usage (27.5%) – behavioural changes subject to complementary policy and infrastructure support. The mixed public opinion on the readiness of India to implement a carbon tax (27.5% yes, 29.4% no, 43.1% maybe) also points to a broader institutional uncertainty. This ambiguity is consistent with the general scepticism in developing economies regarding the political feasibility and administrative capacity to implement ambitious climate pricing schemes (Muhammad et al., 2021). Conditional acceptance – 55% say they would support a carbon tax only if public transport gets better – shows the public does not see carbon taxation as a stand-alone fiscal tool, but as part of a wider ecosystem of mobility and sustainability.

Conclusion

This study examined public awareness, perceptions, acceptance and socio-economic and demographic determinants influencing acceptance of carbon tax policies on transport-related emissions among 108 respondents in India. Overall, the results show a generally positive attitude towards carbon taxation as a tool for environmental policy, although ambiguous and constrained, and strongly reliant on complementary policies, fair design and transparent governance. Demographically, age, gender, and income have only a borderline influence on carbon tax awareness, suggesting that awareness gaps are widespread and not confined to any particular group. Although most people are aware that carbon prices are intended to reduce pollution, statistics show that this awareness does not result in strong convictions or particular policy support. The most potent factor influencing acceptability is still environmental benefits, which emphasises the necessity of policymakers communicating environmental issues in a clear and consistent manner. It is notable that nearly 90% of the respondents deny in public acceptability regarding carbon tax frameworks unless a viable alternative along

with revenue recycling measures, such as income-linked refunds, subsidies for EVs and public transport, and targeted relief for low-income households, is incorporated into any workable carbon tax structure for India. The study also highlights that a hybrid policy approach of carbon pricing with improved public transport, EV incentives, charging infrastructure, and phased implementation would result in effective implementation of the policy in the perspective of both environment and public acceptability. Building public trust and approval over time will depend on transparent revenue usage and reliable communication of environmental outcomes.

The results highlight the need for a more organised, inclusive, and phased approach to carbon pricing. It is a notable fact that India accounts for 7.57% of global CO₂ emissions and that its mitigation strategy has mostly relied on fiscal tools like coal taxation rather than a comprehensive carbon trading system. With justice, transparency, and complementing infrastructure at its foundation, a nationally coordinated carbon tax policy could bring India's climate obligations into line with long-term sustainability objectives and public

acceptability.

In sum, carbon taxation is neither wholly accepted nor wholly rejected by the Indian public — it is conditionally accepted. The conditions are clear: improve public transport, subsidise clean vehicles, protect the poor, and communicate honestly. Meeting these conditions is not merely a policy design challenge; it is the foundational requirement for making carbon taxation a legitimate and lasting instrument of climate governance in India.

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